REMARKS

Amendment and the Request For A Continued Examination (RCE) is pursuant to payment of the fee for a 3-month extension of time bringing the due date for a response to the Final Rejection to September 24, 2010.

It is seen that claim 1 is amended extensively so as to eliminate indefiniteness under 35 U.S.C. 112 and to provide patentability under 35 U.S.C. § 102 and 103. In particular, claim 1 provides the following criteria:

1. The crude glycerol is subjected to only vacuum treatment prior to being directly reacted in an etherification step or in an acetalization step, i.e. without any neutralization or washing steps, support being found on page 7, lines 1 and 2.

2. At the outlet of the reactor for the transesterification step, the effluent is subjected to a vacuum or distilling to at least partially eliminate excess methanol and the glycerol by simple static decantation.

3. A terminal clause is added indicating that all of the triglyceride used in the process is used as biofuel which is supported by page 8, line 12.

4. The glycerol is subjected to a vacuum treatment to remove unreacted at least one primary monoalcohol (e.g. methanol), and because of the separation step of the heterogeneous catalyst from the products, the resultant products are free of catalysts or catalytic byproducts.

It is further noted that claims 5, 9 and 10 are more limited in light of page 6, lines 7-26.

It is also seen that new claim 21 is directed to the working examples where the triglyceride is rapeseed oil and the resultant crude vacuum treated glycerol is reacted with isobutene, n-butyraldehyde or acetone, from the working examples.

The remaining amendments are believed to be self-explanatory.

It is to be recalled that the present invention is provided in the context of an extraordinarily crowded art, as exemplified by the cited references. Thus, even a minor improvement is worthy of patent protection, especially in the field of biodiesel where relative economics will ultimately dictate the success or failure of a given project to replace conventional gasoline or diesel fuel.

In the present case, there are several advantages which derive from the fact that Applicants utilize a solid catalyst as defined by claim 2 and specifically avoid washing and neutralization steps which were generally considered to be necessary in prior art processes using homogeneous catalysts. Furthermore, all of the triglyceride treated in Applicants' process is useable as a biofuel.

The following comments respond to the FINAL REJECTION:

Further, it is also noted that the Final Rejection of March 24, 2010 did not acknowledge Applicants' Information Disclosure Statement filed January 26, 2010 citing U.S. 5,908,948 to Stern et al. and also French reference 2752242.

The rejection of claims 1 and 12 under 35 U.S.C. 112 is cured by the use definite language consisting with the specification.

With respect to the rejection over Bradin (U.S. 5,578,090) in view of the English translation of Hillion, Applicants incorporate by reference the discussion of these references provided in Applicants' reply of January 26, 2010. Also, as pointed out above, the Hillion et al. reference is realistically not combinable since it relates to the transesterification of ricin oil of which 90% is constituted of 12-hydroxy-9-octadecenoic acid. To avoid dehydration which would involve the formation of a conjugated double bond, particular zinc-based catalysts were employed. Furthermore, Hillion et al. provides washing stages of the ester phase in order to separate the resultant glycerin from the monoesters of ricin. Consequently, there would be no interest to one of ordinary skill in the art to use any of the teachings of the Hillion et al. reference to modify the teachings of Bradin in this highly crowded art.

Also in the FINAL REJECTION includes on page 9, starting at line 12, a discussion wherein lines 1-15 of column 6 of Bradin are cited. Applicants do not understand the relevance of that section of Bradin since it deals with the esterification of free fatty acids on the one hand, and the Office Action appears to ignore page 5, lines 53-57 which teaches the use of acid or basic catalysts for the reactions.

The Bournay et al. reference U.S. cited for the first time in the Final Rejection, U.S. 6,878,837 though suggesting heterogeneous catalysis for a transesterification reaction, does not suggest the important aspect of Applicants' invention which permits ethers or acetals of glycerol

to be directly incorporated into a fuel composition. In other words, according to Applicants' claim 1, before being converted into an ether or an acetal the glycerol is subjected to a purification step consisting of a vacuum treatment to remove primary monoalcohol, but it is not further treated before etherification or acetalization.

As for the Delgado Douche publication 2003/0167681, it is less pertinent. Specifically, Applicants incorporate by reference the discussion on page 9 of Applicants' Amendment of December 11, 2009 pointing out that the reference teaches away from Applicants' invention by using homogeneous catalysis, requiring a neutralizing agent for the glycerol. The neutralizing agent or a reaction product thereof becomes a contaminant which must be removed in a following step.

Finally, Applicants respectfully submit that in view of this crowded art, there would have been no motivation for one of ordinary skill in the art to combine the intricate references in a hindsight manner as accomplished in the Final Rejection. Accordingly, the claims at issue are directed to both novel and unobvious subject matter. There is ample legal precedent to support patentability based on a seemingly minor difference in a crowded art.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

/I. William Millen/

I. William Millen, Reg. No. 19,544
Attorney/Agent for Applicant(s)

MILLEN, WHITE, ZELANO
& BRANIGAN, P.C.
Arlington Courthouse Plaza 1, Suite 1400
2200 Clarendon Boulevard
Arlington, Virginia 22201
Telephone: (703) 243-6333
Facsimile: (703) 243-6410

Attorney Docket No.: PET-2271

Date: September 24, 2010